

## WHAT IS CLAIMED IS:

1. An electron beam exposure apparatus for exposing a wafer by an electron beam, comprising:
  - an electron beam generating section for generating the electron beam;
  - a deflector for deflecting the electron beam;
  - a deflection control section for outputting a deflection control signal for causing said deflector to deflect the electron beam; and
  - a control signal storage section for storing a value of the deflection control signal output from said deflection control section.
2. The electron beam exposure apparatus as claimed in claim 1, wherein said control signal storage section and said deflector are monolithically integrated on a semiconductor substrate.
3. The electron beam exposure apparatus as claimed in claim 2, wherein
  - said deflection control section outputs the plurality of deflection control signals, and
  - said deflector comprises:
    - an aperture penetrating through the semiconductor substrate through which the electron beam passes; and
    - a plurality of deflecting electrodes provided in edges of said aperture for receiving the plurality of deflection control signals, respectively, said plurality of deflecting electrodes being electrically isolated from one another, and said control signal storage section stores the values of the plurality of deflection control signals.

4. The electron beam exposure apparatus as claimed in claim 1, further comprising a switch for switching whether the deflection control signal is to be supplied to said control signal storage section.

5. The electron beam exposure apparatus as claimed in claim 4, wherein

said deflection control section outputs the deflection control signal, which is a binary signal, which is to be stored in said control signal storage section when said switch supplies the deflection control signal to said control signal storage section, and

said deflection control section outputs the deflection control signal, which is an analog signal, when said switch does not supply the deflection control signal to said control signal storage section.

6. The electron beam exposure apparatus as claimed in claim 1, further comprising a plurality of said deflectors, wherein

said deflection control section supplies a plurality of deflection control signals to said plurality of deflectors, and

said control signal storage section stores values of the plurality of deflection control signals in parallel, and outputs them to said deflection control section in series.

7. The electron beam exposure apparatus as claimed in claim 6, wherein

said deflection control section further outputs a clock signal,

said control signal storage section outputs a value of the

deflection control signal according to the clock signal, and  
said deflection control section suspends the output of the clock signal when said deflector is deflecting the electron beam.

8. The electron beam exposure apparatus as claimed in claim 6, wherein said control signal storage section comprises a shift register including a plurality of flip-flops provided corresponding to said plurality of deflectors, the flip-flops storing thereon values of the corresponding deflection control signals.

9. The electron beam exposure apparatus as claimed in claim 6, wherein said deflection control section diagnoses contact between each of said plurality of deflectors and said deflection control section based on the deflection control signals output from said control signal storage section.

10. The electron beam exposure apparatus as claimed in claim 9, wherein said deflection control section identifies one of said deflectors which is not connected to said deflection control section.

11. A deflection apparatus for deflecting an electron beam based on a deflection control signal, comprising:

a control signal storage section storing thereon a value of the deflection control signal; and

a deflector for deflecting the electron beam based on the deflection control signal.

12. An electron beam exposure method for exposing a wafer by an electron beam, comprising steps of:

outputting a deflection control signal for causing a deflector to deflect the electron beam;

storing a value of the deflection control signal output in said deflection control signal outputting step;

generating the electron beam; and

deflecting the electron beam.